Golden Spread Electric Cooperative, Inc.

Smart Grid Project

Abstract

Golden Spread Electric Cooperative, Inc. (GSEC) Smart Grid Project deploys advance metering and distribution automation to 10 of its 16 member distribution cooperatives (co-ops). Each member co-op designed and planned their projects to address specific challenges and achieve benefits. In general, the projects aim to reduce customer electricity costs, peak demand, and operations costs while improving distribution reliability. The project deploys about 81,785 smart meters in total and advanced communication networks to: (1) allow select customers to view their electricity usage through a Web portal and/or in home display, (2) allow participating co-ops to manage, measure, and verify targeted reductions during peak periods, and (3) reduce operations and maintenance costs by automating meter reading and service tasks.

Smart Grid Features

Communications infrastructure includes equipment for each distribution co-op to connect its advanced metering infrastructure (AMI) and distributed automation devices to their head end systems. The co-ops are using different systems and approaches depending on the terrain in their service territory. Options include wireless and power line carrier communications systems.

Advanced metering infrastructure includes the deployment of approximately 81,785 smart meters throughout the 10 distribution co-ops. For some co-ops, this means 100% coverage, for others this involves pilot programs to understand the operational capabilities and benefits. AMI meters enable two-way communication necessary to support electricity usage information exchange, which supports better management of customer loads. Operational cost savings are derived from two-way communications which enable the automation of customer service requests and meter reading. In some cases, AMI systems are being integrated with outage management, distribution, and customer information systems enabling the co-ops to respond to outage and customer requests more efficiently.

Advanced electricity service options offered through the project include a deployment of in-home displays to a total of 1,500 customers in the Taylor Electric Cooperative's distribution service

At-A-Glance

Recipient: Golden Spread Electric Cooperative, Inc.

State: Texas

NERC Region: Texas Regional Entity

Total Budget: $43,157,788

Federal Share: $17,263,115

Key Partners: Bailey County, Big Country, Deaf Smith, Lamb County, Lighthouse, Lyntegar, North Plains, Rita Blanca, South Plains, and Taylor

Project Type: Advanced Metering Infrastructure and Customer Systems Electric Distribution Systems

Equipment

- 81,785 Smart Meters
- AMI Communication Systems
  - Meter Communications Network
  - Backhaul Communications
- Meter Data Management System
- Web Portal Access for Select Customers
- 1,500 In-Home Displays
- 1,500 Programmable Communicating Thermostats
- 6,500 Direct Load Control Devices
- Distribution Automation Equipment for 158 out of 632* circuits
  - Distribution Management Systems
  - Distribution Automation Communications Network
  - SCADA Communications Network
  - Automated Distribution Circuit Switches
  - Automated Capacitors
  - Automated Voltage Regulators
  - Equipment Condition Monitors

** Across all participating co-ops, including those that are not deploying distribution automation equipment*

Key Targeted Benefits

- Improved Electric Service Reliability and Power Quality
- Reduced Costs from Equipment Failures, Distribution Line Losses, and Theft
- Reduced Greenhouse Gas and Criteria Pollutant Emissions
- Reduced Meter Reading Costs
- Reduced Operating and Maintenance Costs
- Reduced Truck Fleet Fuel Usage

Golden Spread Electric Cooperative, Inc. *(continued)*

territory. These customers are also being given the option to have a programmable communicating thermostat or a direct load control device connected to their air conditioner. These devices facilitate two-way exchange of information and enable customers to better manage their electricity use and costs through appliance control. Customers can enroll in a pre-pay option that enables them to budget the dollar amount of electricity they plan to use each month to help keep their electricity use affordable.

Direct load control devices are installed in Lamb County, Rita Blanca, and South Plains distribution territories. A total of 6,500 direct load control devices are being deployed with 5,150 of those switches being deployed in the South Plans region alone. The load control devices are used for both residential air conditioning and large irrigation pumping. Participating customers receive rebates on their electric bill in exchange for allowing the distribution cooperative to reduce load during peak periods.

Distribution automation systems include the deployment of a variety of devices throughout the distribution systems. Certain cooperatives are using distribution automation deployments to address specific needs. While each deployment is different, all work to improve distribution system reliability and operational efficiency. Distribution automation devices include switches, remote terminal units, supervisory control and data acquisition (SCADA), and other intelligent electronic devices.

Distribution system energy efficiency improvements involve the deployment of integrated voltage/volt ampere reactive control by Deaf Smith, South Plains, and Taylor distribution territories. The devices improve the efficiency of the distribution systems, reduce line losses, and improve power quality.

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q2 2010
Distribution automation asset deployment begins	Q2 2010
AMI asset deployment ends	Q2 2012
Distribution automation asset deployment ends	Q2 2012

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